

**DATA PROCESSING APPARATUS, IMAGE PROCESSING  
APPARATUS, AND METHOD THEREFOR**

**ABSTRACT OF THE INVENTION**

[00184]        Watermark data that indicate additional information, such as copyright information, are optimized in accordance with the contents of object data, and the watermark data is embedded in image data. An image divider 200 divides image data  $V_i$  into image blocks  $I_{ij}$ , and corresponds a selected basic pattern  $P_{hij}$  with each of the image blocks  $I_{ij}$ . Orthogonal transformation units 24 and 202 generate DFT coefficients  $I''_{ij}$  and  $P'_{hij}$ , and power element calculators 208 and 264 generate power elements  $I'''_{ij}$  and  $P''_{hij}$ . A basic pattern adjustment unit 26 adjusts the coefficient of  $P'_{hij}$  to generate  $P'_{hij1}$  to  $P'_{hijn}$ . A watermark pattern generator 28 calculates variations before and after  $P'_{hij1}$  to  $P'_{hijn}$  are embedded in  $I''_{ij}$ , and selects, from  $P'_{hij1}$  to  $P'_{hijn}$ ,  $P'''_{hij1}$  to  $P'''_{hijl}$  that provide variations equal to or smaller than the threshold value  $e$ . Then, the watermark pattern generator 28 selects, as a watermark pattern  $P'_{ij}$ , the pattern that is most easily detectable, and a pattern embedding unit 204 that adds  $P'_{ij}$  to  $I'_{ij}$ .